

United States Patent

Ashlock et al.

(11) 4,393,491
(43) Jul. 12, 1983

[54] AUTOMATIC SELF-TEST SYSTEM FOR A DIGITAL MULTIPLEXED TELECOMMUNICATION SYSTEM

[73] Inventors: Robert L. Ashlock, Diamond Bar; Carl E. Gebelstein, Santa Ana; Douglas P. Kerr, Irvine; David J. Rasmussen, Riverside; Theodore M. Roney, Costa Mesa; Charles W. Theob, Tustin, all of Calif.

[72] Assignee: American-Edison, Orem, Utah, Corp.

[21] Appl. No. 204,300

[22] Filed Nov. 8, 1980

[31] Int. Cl. H04M 3/00

[32] U.S. Cl. 379/13; 179/175.2 R;

[36] Field of Search 379/11, 14, 15, 16;

379/17, 18; 171/21, 22; 179/175.2 R

[46] References Cited

U.S. PATENT DOCUMENTS

No. 3,498 12/1977 Symon
3,151,769 2/1980 Johnson et al.
3,880,274 8/1979 Thomsen
3,942,551 1/1980 Johnson
3,947,577 6/1981 Pfeiffer
3,111,774 6/1984 Parnet
3,213,303 8/1986 Bergman et al.
3,231,947 5/1986 Schlichte
3,262,217 6/1986 Schlichte
3,336,362 10/1986 Von Barden et al.
3,384,377 1/1987 Carter
3,503,519 1/1987 Carter
3,403,903 1/1988 Schlichte
3,440,039 1/1988 Kora
3,589,140 1/1971 Naguma et al.
3,625,744 1/1971 Krahn et al.
3,673,336 6/1972 Thomas
3,641,120 6/1972 Schlichte
3,648,711 6/1972 Rote et al.
3,703,387 12/1972 Marino
3,713,305 2/1973 Gordon et al.
3,757,244 3/1973 Olger
3,767,137 12/1973 Cohn et al.
3,741,441 12/1973 Shaffer et al.

3,757,431 1/1974 Lewis
3,758,143 1/1974 Shih et al.
3,760,772 2/1974 Atkinson et al.
3,828,654 6/1974 Dickey et al.
3,823,401 7/1974 Berg et al.
3,879,582 4/1975 White et al.
3,881,264 6/1975 Fletcher
3,903,170 6/1975 Corbary et al.
3,903,178 6/1975 Lee et al.
3,911,218 10/1975 Scully et al.
3,912,392 10/1975 Buchanan
3,914,129 10/1975 Kaufman
3,914,540 10/1975 Owsen
3,917,116 11/1975 Chouk et al.
3,919,488 11/1975 Maunich
3,924,077 12/1975 Shokles
3,937,892 2/1978 Smith et al.
3,942,772 2/1978 Bergan
3,976,026 5/1978 Madal et al.
3,983,370 6/1978 Conder et al.
3,978,272 6/1978 Hui et al.
3,983,308 10/1978 Kuo
3,983,307 10/1978 Chambers, Jr.
4,027,340 2/1977 Russell
4,029,615 6/1977 Rober et al.
4,035,710 9/1977 Joyce
4,048,448 9/1977 Camell et al.
4,060,523 9/1977 Levi
4,077,895 11/1977 Olson
4,079,239 12/1978 Sanderson
4,081,411 1/1978 Bates et al.
4,085,165 6/1978 Bova
4,107,816 12/1978 Orsano et al.
4,140,577 2/1979 Jodlow et al.
4,149,036 4/1979 Finoda et al.
4,149,641 4/1979 Cui et al.
4,151,490 4/1979 Bado
4,161,423 7/1979 Trauber
4,161,833 7/1979 Wolter
4,174,467 1/1979 Forster
4,192,027 2/1980 Becker
4,191,206 2/1980 Schmidt
4,197,433 4/1980 Thad
4,207,433 6/1980 Bartholomew et al.
4,209,828 6/1980 Pagnite
4,221,913 9/1980 Bay
4,223,403 10/1980 Darby et al.
4,224,196 11/1980 Edmund et al.
4,228,851 12/1980 Roth et al.
4,244,293 5/1981 Regan et al.
4,270,023 5/1981 Young

2738042 January 1979 DE
1444919 August 1976 GB
2002202 February 1979 GB

OTHER "Study of a Rural Digital End Office", by M. J. Kelly, GTE PUBLICATIONS Automatic Electric Journal, May, 1977, pp. 294-302.

Applications for Programmable Ringing Generators by D. J. Becker, Inteltec '78, International Telephone Energy Conference, (Washington, D.C.), 25-27, Oct. 1978, conference record.

"A New Approach to Testing Loops Serves by Pair Gain Systems", Swanson, Bell Labs, 1979.

ART-UNIT: 234

PRIMARY-EXAMINER: Robinson; Thomas A.

ATTY-AGENT-FIRM: Knobbe, Martens, Olson & Bear

ABSTRACT:

An automatic self-test apparatus for use in a digital multiplexed communication system and self-testing idle circuitry coupled to idle telephone lines. The apparatus utilizes a tone generator which generates digital words describing an analog test signal and a detector which detects digital data on the internal data bus which describes this self-test analog signal. The data from the tone generator is coupled to the circuitry connected to the idle line through a time division multiplexer under the control of a controller consisting of a programmed microprocessor. The microprocessor controls when the transfer is made and to which telephone line it is directed. This control is accomplished by writing a control word to a multiplexer naming the source and destination for the transfer and the time slot in which it is to occur. When the circuitry connected to the idle line functions properly, the controller proceeds to the next idle line. If a malfunction is detected, the controller sets an alarm.

34 Claims, 15 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 12

Details Text Image HTML PRO

For

10/599617

United States Patent (15)

Sullivan et al.



US005887051A

(11) Patent Number: 5,887,051

(45) Date of Patent: Mar. 23, 1999

LISTENING DEVICE FOR TRACING LINE CONTINUITY AND DETECTING TELEPHONE DIAL TONE

(75) Inventors: Robert W. Sullivan, Simi Valley, Lee A. Washkin, Thousand Oaks, both of Calif.

(73) Assignee: TEST-UM, Inc., Camarillo, Calif.

(21) Appl. No.: 900,212

(22) Filed: Jul. 24, 1997

(51) Int. Cl.⁴ H04M 1/24

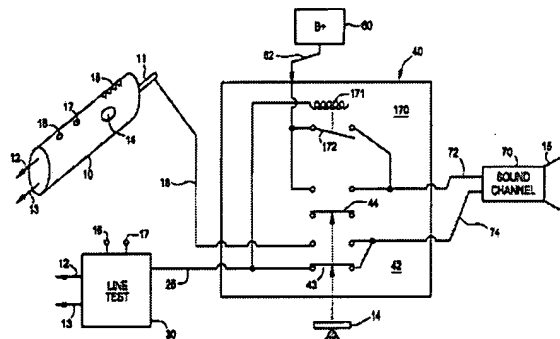
(52) U.S. Cl. 379/21; 379/27

(56) Field of Search 379/21-27, 30, 379/32, 22, 24, 26, 34

References Cited**U.S. PATENT DOCUMENTS**4,922,516 5/1990 Butler et al. 379/21
3,025,444 6/1961 Hilliges et al. 379/21Primary Examiner—Paul Loomis
Attorney, Agent, or Firm—Gesa W. Arant; Christopher R. Balzac**ABSTRACT**

A pocket-size hand-held testing tool is provided for testing the operation of telephone lines and tracing the location of electric wires, including a sound signal channel with an output speaker, a dial tone detection circuit for detecting a dial tone on a telephone line, a probe for capacitively receiving a signal from a particular wire in a bundled wire cable to identify that wire as one to which a tracing signal is being applied at the other end of the cable, and a momentary switch normally connecting the dial tone detection circuit into communication with the sound signal channel but manually depressable to instead selectively switch the probe into communication with the sound signal channel while disconnecting the dial tone detection circuit from it.

17 Claims, 8 Drawing Sheets



US-PAT-NO: 5887051

DOCUMENT- US 5887051 A

IDENTIFIER:

TITLE: Listening device for tracing line continuity and detecting telephone dial tone

Abstract Text - ABTX (1):

A pocket-size hand-held testing tool is provided for testing the operation of telephone lines and tracing the location of electric wires, including a sound signal channel with an output speaker, a dial tone detection circuit for detecting a dial tone on a telephone line, a probe for capacitively receiving a signal from a particular wire in a bundled wire cable to identify that wire as one to which a tracing signal is being applied at the other end of the cable, and a momentary switch normally connecting the dial tone detection circuit into communication with the sound signal channel but manually depressable to instead selectively switch the probe into communication with the sound signal channel while disconnecting the dial tone detection circuit from it.

Divaly et al.

[14] DIGITAL COMMUNICATION APPARATUS
AND METHOD

[75] Inventors: Lee V. Elvey; Donald R. Candy,
both of Tulsa, Okla.

[77] Assignee: Scherer Technologies, Tulsa, Okla.

(21) Appl. No.: 263,170
(22) Filed: Oct. 27, 1964

[51] Int. Cl. _____ G01B 21/28; H04B 3/46
[52] U.S. Cl. _____ 371/292; 370/13.1;

[38] Field of Search 371/20.2, 20.3, 20.6;
370/13.1, 15; 378/4, 5

[54] References Cited

U.S. PATENT DOCUMENTS

U.S. PATENT DOCUMENTS			
4,808,863	9/1973	Gilbert et al.	571/25.1
4,004,436	2/1977	Witt	571/25.2
4,098,405	1/1978	Markovitch et al.	570/1.1
4,112,813	9/1978	Lauritzen	571/25.3
4,112,414	9/1978	Jacot et al.	571/25.4
4,025,602	1/1984	Beaudet	571/25.5
4,384,513	1/1986	Bhatt	571/25.6

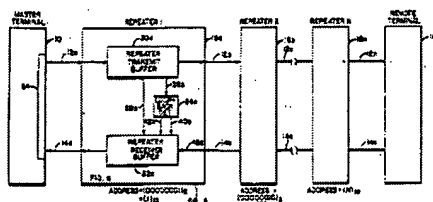
OTHER PUBLICATIONS
DS-1 Interface Connector, TA-TSY-00012; Issue 1,
Oct. 1914; Bell Communications Research".

Primary Examiner—Charles B. Addison
Attorneys, Agents & Firms—William R. Clark; Richard M. Starkansky

[57] **ABSTRACT**

A TI digital carrier system having a transmitter, receiver and a plurality of intermediate repeater stages. Each remote repeater has a select switch for automatically selecting the remote repeater to be placed in loop-back mode should a combination of framing bit occur in the serial bit stream that matches that said remote repeater address therein. thereby allowing remote testing of the communications link and repeaters. A address, no additional user lines are required to verify a TI communications link.

20 Claims, 8 Drawing Sheets



US-PAT-NO: 4980887

DOCUMENT-IDENTIFIER: US 4980887 A

TITLE: Digital communication apparatus and method

Abstract Text - ABTX (1):

A T1 digital carrier system having a transmitter, receiver and a plurality of intermediate repeater stages. Each remote repeater has a select switch for automatically selecting that the remote repeater be placed in loop-back mode should a combination of framing bits occur in the serial bit stream that matches that said remote repeaters address therein, thereby allowing remote testing of the communications link and repeaters. In addition, no additional test lines are required to verify a T1 communications link.

US Document Identifier - DID (1):

US 4980987 A

Brief Summary Text - BSTX (4):

As is also known in the art, one type of digital communication system is a T1 communication system. A typical T1 system has a pair of transmit lines through which the master terminal transmits information to the remote terminal and a pair of receive lines by which the remote terminal transmits to the master terminal. A T1 system also has an additional pair of test wires that parallel the transmit/receive lines. The purpose of the test wires will be explained later. Suffice it to say here, however, that with such a system, information is transmitted as a series of superframes. Each superframe is made up of 12 frames, F.sub.1 - F.sub.12 as shown in FIG. 1. (Each frame has a time duration of 125 microseconds). Each one of the frames F.sub.1 - F.sub.12 in turn is made up of 24 time slots or channels, C.sub.1 - C.sub.24. Each time slot C.sub.1 - C.sub.24 has up to 8 bits of data or voice information, as shown for exemplary time slot C.sub.2 as C.sub.2 b.sub.1 - C.sub.2 b.sub.8. Each one of the frames, F.sub.1 - F.sub.12, also includes a framing bit FB.sub.1 - FB.sub.12, respectively, as shown in FIG. 2. Thus, exemplary frame F.sub.2 is shown



US007127041B1

(11) United States Patent
Houck(10) Patent No.: **US 7,127,041 B1**
(45) Date of Patent: **Oct. 24, 2006****(30) SIMULTANEOUS TRACING OF MULTIPLE
PHONE/DATA CABLES**(76) Inventor: **Richard B. Houck**, 110 9 Jacinto Way,
811, Salkey, CA (US) 95004(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 416 days.

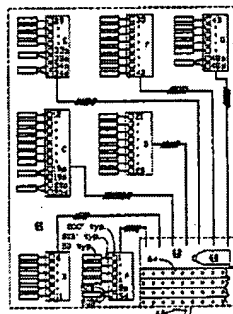
(21) Appl. No.: 10/059,872

(22) Filed: Feb. 4, 2003

(51) Int. Cl.
H04M 1/24 (2006.01)
H04M 1/00 (2006.01)
H04M 1/22 (2006.01)
H01B 11/02 (2006.01)
G01R 13/00 (2006.01)(52) U.S. Cl. 379/25; 379/31; 379/32.07;
324/515; 324/55(58) Field of Classification Search 379/01,
379/12, 18, 19, 21, 22.06, 22.07, 23; 324/512,
324/515, 525, 754, 755, 65; 340/833.2,
340/914, 518, 3.4, 825.34, 825.49
See application file for complete search history.**(56) References Cited****U.S. PATENT DOCUMENTS**3,902,026 A * 8/1975 Rogers et al. 340/825.34
3,903,380 A * 8/1975 Schomburg 324/66
5,557,651 A * 9/1996 Weissman 379/22.02
5,887,051 A * 3/1999 Sullivan et al. 379/21
6,233,358 B1 * 5/2001 Whalley 704/2706,798,183 B1 * 8/2004 Boley et al. 379/25
6,879,664 B1 * 8/2005 Boley et al. 379/25
2001/0096137 A1 * 5/2003 Strick 379/22.02
2004/0000898 A1 * 1/2004 Pool et al. 324/66
* cited by examinerPrimary Examiner—Quoc Tran
(74) Attorney, Agent, or Firm—J. E. McTaggart**ABSTRACT**

For tracing multi-conductor cable runs from multiple phone/data locations throughout a building or complex to a junction facility where the cables need to be systematically identified and connected to a terminal panel, rapid tracing and identification are accomplished by deploying a large number of special low-cost senders, e.g. a set of forty eight senders, connecting as many senders as required to energize every cable at each location via its standard modular jack. Each sender delivers a unique identifier signal, e.g. a spoken number from 1 to 48, energizing a corresponding phone cable and/or data cable. With all of the cables thusly energized simultaneously and distinguishably, a technician working with a proximity probe in the junction facility can rapidly identify and tag and/or connect all the cables in an uninterrupted session, without requiring the usual assistant and intercom link, and with no time wasted probing unenergized cables. For larger systems beyond the tracing capability of the set number of senders, a range switch provides three additional extension ranges with unique identification numbers to preserve a numerical sequence when more than one session is required. As an optional refinement, one or more of the senders may be further equipped to enable wire-mapping of all active conductors in the cables.

6 Claims, 3 Drawing Sheets



3902026	August 1975	Rogers et al.	340/825.36
3903380	September 1975	Schomburg	324/66
5557651	September 1996	Weissman	379/22.02
5887051	March 1999	Sullivan et al.	379/21
6233558	May 2001	Whalley	704/270
6798183	September 2004	Bohley et al.	324/66
6879664	April 2005	Stephens	379/26.01
2003/0096537	May 2003	Schultz	379/32.05
2004/0000898	January 2004	Pool et al.	324/66

ART-UNIT: 2614
PRIMARY-EXAMINER: Tran; Quoc
ATTY-AGENT-FIRM: McTaggart; J. E.

ABSTRACT:

For tracing multi-conductor cable runs from multiple phone/data locations throughout a building or complex to a junction facility where the cables need to be systematically identified and connected to a terminal panel, rapid tracing and identification are accomplished by deploying a large number of special low-cost senders, e.g. a set of forty eight senders, connecting as many senders as required to energize every cable at each location via its standard modular jack. Each sender delivers a unique identification signal, e.g. a spoken number from 1 to 48, energizing a corresponding phone cable and/or data cable. With all of the cables thusly energized simultaneously and distinguishably, a technician working with a proximity probe in the junction facility can rapidly identify and tag and/or connect all the cables in an uninterrupted session, without requiring the usual assistant and intercom link, and with no time wasted probing unenergized cables. For larger systems beyond the tracing capability of the set number of senders, a range switch provides three additional extension ranges with unique identification numbers to preserve a numerical sequence when more than one session is required. As an optional refinement, one or more of the senders may be further equipped to enable wire-mapping of all active conductors in the cables.

6 Claims, 3 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 2

Details	Text	Image	HTML	PDF
9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
US 4922516 A	19900501	18	Telephone technician's terminals with	379/

Dec. 31, 1991

. Sheet 3 of 4

5,077,731

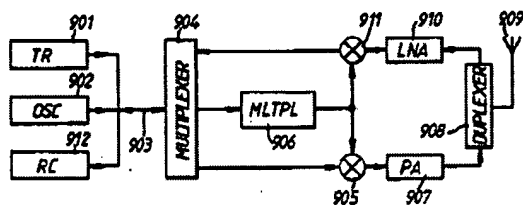


Fig.7
(PRIOR ART)

US-PAT-NO: 5077731

DOCUMENT-IDENTIFIER: US 5077731 A

TITLE: Telecommunication arrangement

Detailed Description Text - DETX (19):

FIG. 6 is a block diagram of a RF module 12 connected to TC equipment 11 shown in FIG. 5 through communication cable 13. The first and second transmitting signals from communication cable 13 are introduced in switching means 613 which is controlled by a detecting signal from tone detecting means 629.

Detailed Description Text - DETX (20):

When synthesizer 5111 in FIG. 5 generates the first transmitting signal, the tone signal from communication cable 13 is supplied to tone sensing means 629, which includes detector 6291 and a comparator 6292, through an inductor L. Detector 6291 detects level of the tone signal. Comparator 6292 compares the level with a reference level. If the level of the tone signal is greater than the reference level, comparator 6292 produces the detecting signal which controls to close switching means 613. Therefore, the first transmitting signal is supplied to a mixer 614.

File Edit View Tools Window Help



L14: (9) ("4922516" | US 5025466 | Tag: S.P.T1 | Doc: 8/9 | "Full" 1/70 | L14: (9) ("4922516" | US 5025466 A | Tag: S.P.T1 | Doc: 8/9 | Front

United States Patent (19)

Hilliges et al.

(11) Patent Number: 5,025,466
(45) Date of Patent: Jun. 18, 1991

(34) TELEPHONE TEST INSTRUMENT

(75) Inventors: William R. Hilliges, Lawrence D. Hilliges, both of Ashland, Oreg.; David Van Winkle, Sand Valley, Calif.; Myron C. Seiler, Seiler, Ochs.

(73) Assignee: Communications Manufacturing Company, Los Angeles, Calif.

(21) Appl. No.: 033,181

(22) Filed: Mar. 14, 1990

(31) Int. Cl.: H04M 1/28; H04M 1/24

(32) U.S. Cl.: H04M 19/00

(34) Field of Search: 379/21, 4, 413, 27, 378/29

(36) References Cited

U.S. PATENT DOCUMENTS

3,675,319 6/1972 Wolf et al. 179/2
3,778,356 12/1971 Mann et al. 179/20 E
3,778,359 1/1974 O'Neil 179/175
3,928,710 12/1976 Kell 179/1 P8
4,103,810 10/1978 Smith et al. 179/20 E
4,376,098 3/1981 O'Neil 179/175
4,484,441 4/1982 Evans et al. 179/1
4,483,246 1/1982 Peltz et al. 179/20
4,681,336 8/1987 Duvessa et al. 179/21
4,701,645 1/1987 Duvessa et al. 179/21
4,514,445 1/1982 Raper et al. 179/27

OTHER PUBLICATIONS

CMC publication entitled "CMC 7900 Run-In Test Set" published at least one year prior to Jan. 1990, labeled Exhibit 1.

Harris Corporation publication introducing the test set with a built-in enabled speaker published at least one year prior to Jan. 1990, labeled Exhibit 2.

AT&T publication entitled "Craft Access Terminal" dated Jan. 1983 and labeled Exhibit 3.

Telephone publication entitled "Powerful new tool makes field craft more self-reliant", dated Sep. 2, 1989 and labeled Exhibit 4.

Telephone Engineer & Management article entitled

"They terminal the telco team" dated Jul. 1, 1986 and labeled Exhibit 5.

Necsy catalog page entitled "Operating Instructions" dated 2/20/1988 and labeled Exhibit 6.

Ziad Inc. publication entitled "The PHD TM Technician-More Than Just An Educated Guess" dated Jun. 1985 and labeled Exhibit 7.

Ziad Inc. publication entitled "Introducing Line Master TM", published at least one year prior to Jan. 1990 and labeled Exhibit 8.

Nicollet Technologies, Inc. entitled "Introducing the DigiSmart TM. 4000-R" dated 1987 and labeled Exhibit 9.

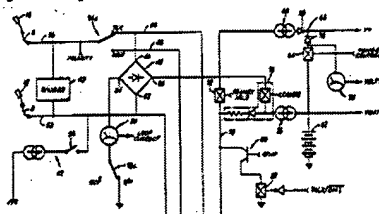
Primary Examiner-Stafford D. Schreyer

Attorney Agent or Firm-Laney, Dougherty, Hessin & Beavers

(37) ABSTRACT

A telephone test instrument permits voice communications with and monitoring of a telephone circuit to be tested. The instrument includes a microprocessor used in controlling various functions of the instrument. The microprocessor and other circuits of the instrument are energized from a connected telephone circuit and/or an internal energy supply which is automatically recharged from the telephone circuit. The microprocessor continually checks the voltage of the internal energy supply and automatically turns off a loudspeaker of the instrument, or prevents it from being turned on, if the voltage is too low. The instrument includes a circuit which, in combination with the microprocessor, measures loop current or line voltage while the instrument is connected for making voice communications with the telephone circuit. When the loudspeaker within the instrument is energized, the earpiece receiver remains active. A belt hook connected to a housing of the instrument can connect an electrical ground through a switch in the instrument to the telephone circuit for providing a ground start. The instrument also includes a "crow-bar" circuit which effectively opens the instrument from a connected telephone circuit if too high of a loop current flows.

64 Claims, 18 Drawing Sheets



terminal ties telco team" dated Jul. 1, 1986 and labeled Exhibit 5.

Necsy catalog page entitled "Operating Instructions" dated 2/20/1988 and labeled Exhibit 6.

Ziad Inc. publication entitled "The PHD TM. Telecommunicator-More Than Just An Educated Guess" dated Jun. 1985 and labeled Exhibit 7.

Ziad Inc. publication entitled "Introducing Line Master TM.", published at least one year prior to Jan. 1990 and labeled Exhibit 8.

Nicollet Technologies, Inc. entitled "Introducing the DigiSmart TM. 4000-R" dated 1987 and labeled Exhibit 9.

ART-UNIT: 261

PRIMARY-EXAMINER: Schreyer; Stafford D.

ATTY-AGENT-FIRM: Laney, Dougherty, Hessin & Beavers

ABSTRACT:

A telephone test instrument permits voice communications with and monitoring of a telephone circuit to be tested. The instrument includes a microprocessor used in controlling various functions of the instrument. The microprocessor and other circuits of the instrument are energized from a connected telephone circuit and/or an internal energy supply which is automatically recharged from the telephone circuit. The microprocessor continually checks the voltage of the internal energy supply and automatically turns off a loudspeaker of the instrument, or prevents it from being turned on, if the voltage is too low. The instrument includes circuitry which, in combination with the microprocessor, measures loop current or line voltage while the instrument is connected for making voice communications with the telephone circuit. When the loudspeaker within the instrument is energized, the earpiece receiver remains active. A belt hook connected to a housing of the instrument can connect an electrical ground through a switch in the instrument to the telephone circuit for providing a ground start. The instrument also includes a "crow-bar" circuit which effectively opens the instrument from a connected telephone circuit if too high of a loop current flows.

Details | Text | Image | HTML | FRO

8		US 5025466 A	19910618	70	Telephone test instrument	379/
9		US 4922516 A	19900501	18	Telephone technician's terminals with	379/

File Edit View Tools Window Help



L14: (9) ("4922516" | ... | US 5193108 | Tag: S,P,T1 | Doc: 7/9 | "Full" 1/23

United States Patent [19]

Stocklin

[11] Patent Number: 5,193,108
[45] Date of Patent: Mar 9, 1993

[54] PORTABLE TELECOMMUNICATIONS TEST INSTRUMENT WITH INDUCTIVE PROBE CIRCUIT

[71] Inventor: Clay A. Stocklin, Redmond, Wash.
[72] Assignee: Lewtan Manufacturing Co., Inc., Little Neck, N.Y.

[31] Appl. No.: 771,497

[23] Filed: Oct. 4, 1991

[51] Int. Cl. H04M 3/26

[52] U.S. Cl. 379/21; 379/457; 324/333

[53] Field of Search: 379/21; 379/21; 324/333

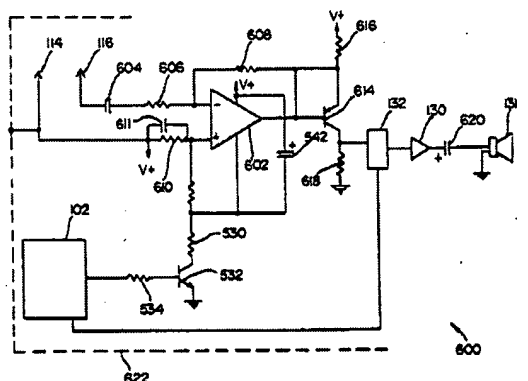
[56] Reference Cited

U.S. PATENT DOCUMENTS

3,379,115 1/1975 Ksane 379/21
4,292,480 9/1981 Sweatt 379/21
4,600,110 7/1986 Feldman et al. 379/21

Primary Examiner—Stafford D. Schreyer
Attorney Agent or Firm—Seed and Berry

4 Claims, 8 Drawing Sheets



FIELD-OF- 379/21; 379/6 ; 379/22 ; 379/24 ; 379/25 ;
CLASSIFICATION-SEARCH: 379/26 ; 379/30 ; 379/1 ; 379/457 ; 324/555
See application file for complete search history

REF-CITED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
3870836	March 1975	Kusama	379/21 N/AN/A
4292480	September 1981	Sweatt	379/21 N/AN/A
4600810	July 1986	Feldman et al.	379/21 N/AN/A

ART-UNIT: 264

PRIMARY-EXAMINER: Schreyer; Stafford D.

ATT-AGENT-FIRM: Seed and Berry

ABSTRACT:

A handheld, battery-powered telecommunications test set which combines the function of tone generator and inductive input probe along with functions such as resistance measurement and continuity/discontinuity. The inductive input is coupled to one input of a differential amplifier, which is susceptible to oscillations caused by leakage currents in the circuits performing other functions. During operation of the inductive input monitor probe, some of these circuits are inactivated, but may still have some leakage current that could flow through them, causing oscillation. Additional circuit elements are added to provide a low resistance pathway to a second input of the differential amplifier to shunt leakage currents from the inactive circuit to the differential amplifier such that the leakage current are converted from a differential signal to a common mode signal and are not amplified. The instrument provides high impedance inputs on circuits which are active when the monitor probe is also active to reduce the leakage currents into the active circuits to an acceptable level.

4 Claims, 17 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 8

Details	Text	Image	HTML	PDF
9	US 4922516 A	19900501	18	Telephone technician's terminals with
379/				

File Edit View Tools Window Help



L14: (9) ("4922516" |... | US 6020822 A | Tag: S | Doc: 5/9 | "Full" 1/6 | Format: PRO

United States Patent (19)

Marshall

(11) Patent Number: **6,020,822**
 (45) Date of Patent: Feb. 1, 2000

(54) **CIRCUIT TESTER**
 (76) Inventor: Forrest A. Marshall, 515 Academy Ave., Dublin, Ga. 31021

5,324,093 25,905 Cervas 324/556
 5,172,143 11,696 Myers 324/555
 5,837,051 31,900 Sullivan et al. 379/21

(21) Appl. No.: 09/128,798
 (22) Filed: Aug. 5, 1998

Primary Examiner—Julie Lien
 Attorney, Agent, or Firm—Dean W. Russell; Kilpatrick Stockton LLP

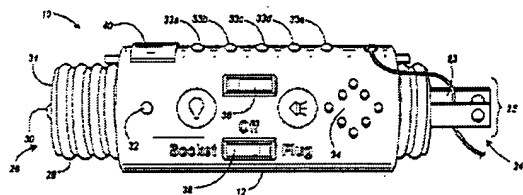
Related U.S. Application Data
 Provisional application No. 60/555,119, Aug. 6, 1997.
 (31) Int. Cl.⁷ G06B 31/00
 (32) U.S. Cl. 340/654; 324/556; 324/133;
 324/156; 324/72.5
 (50) Field of Search 340/654; 324/555;
 324/556; 114, 133, 156, 157, 72.5, 508;
 379/21; 73/865.5

ABSTRACT

A circuit tester which allows the testing of electrical outlets, telephone circuits and light bulb sockets. The circuit tester is cylindrical with two circuit probes. The first probe is a conventional two-prong electrical plug and the second is a conventional male light bulb connector. A standard telephone jack socket is provided on the side of the cylinder.

References Cited
 U.S. PATENT DOCUMENTS
 4,041,380 8/1977 Epstein 324/556

6 Claims, 3 Drawing Sheets



TYPE IPC DATE
 CIPS G01 R 19/155 20060101
 CIPS G01 R 19/145 20060101
 US-CL-ISSUED: 340/654 , 324/556 , 324/133 , 324/156 , 324/72.5
 US-CL-CURRENT: 340/654 , 324/133 , 324/156 , 324/556 , 324/72.5
 FIELD-OF- 340/654; 324/555 ; 324/556 ; 324/114 ; 324/133 ;
 CLASSIFICATION- 324/156 ; 324/157 ; 324/72.5 ; 324/508 ; 379/21 ;
 SEARCH: 73/866.5

See application file for complete search history

REF-CITED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
4041380	August 1977	Epstein	324/556 N/A/N/A
5394093	February 1995	Cervas	324/556 N/A/N/A
5572143	November 1996	Myers	324/555 N/A/N/A
5887051	March 1999	Sullivan et al.	379/21 N/A/N/A

ART-UNIT: 276

PRIMARY-EXAMINER: Lieu, Julie

ATTY-AGENT-FIRM: Russell; Dean W. Kilpatrick Stockton LLP

ABSTRACT:

A circuit tester which allows the testing of electrical outlets, telephone circuits and light bulb sockets. The circuit tester is cylindrical with two circuit probes. The first probe is a conventional two-prong electrical plug and the second is a conventional male light bulb connector. A standard telephone jack socket is provided on the side of the cylinder.

6 Claims, 3 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 3

Details	Text	Image	HTML	PRO
9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
US 4922516 A	19900501	18	Telephone technician's terminals with	379/